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```
=> s natural gas (l) hydrogen (l) carbon monoxide (l) carbon dioxide
        665664 NATURAL
            35 NATURALS
        665685 NATURAL
                  (NATURAL OR NATURALS)
       1460335 GAS
        496679 GASES
       1637697 GAS
                  (GAS OR GASES)
         68229 NATURAL GAS
                  (NATURAL(W)GAS)
        892941 HYDROGEN
          5638 HYDROGENS
        896109 HYDROGEN
                  (HYDROGEN OR HYDROGENS)
       1152276 CARBON
         25288 CARBONS
       1161370 CARBON
                  (CARBON OR CARBONS)
        170064 MONOXIDE
           982 MONOXIDES
        170583 MONOXIDE
                  (MONOXIDE OR MONOXIDES)
        143931 CARBON MONOXIDE
                  (CARBON(W)MONOXIDE)
       1152276 CARBON
         25288 CARBONS
       1161370 CARBON
                  (CARBON OR CARBONS)
        444036 DIOXIDE
          6518 DIOXIDES
        445689 DIOXIDE
                  (DIOXIDE OR DIOXIDES)
        209897 CARBON DIOXIDE
                  (CARBON(W)DIOXIDE)
L1           74 NATURAL GAS (L) HYDROGEN (L) CARBON MONOXIDE (L) CARBON DIOXIDE

=> s l1 and remov? (5a) carbon dioxide
       1182637 REMOV?
       1152276 CARBON
```

```
         25288 CARBONS
        1161370 CARBON
                  (CARBON OR CARBONS)
         444036 DIOXIDE
           6518 DIOXIDES
         445689 DIOXIDE
                  (DIOXIDE OR DIOXIDES)
         209897 CARBON DIOXIDE
                  (CARBON(W)DIOXIDE)
           7313 REMOV? (5A) CARBON DIOXIDE
L2            7 L1 AND REMOV? (5A) CARBON DIOXIDE

=> s l1 and separat? (5a) carbon dioxide
         336919 SEPARAT?
         273731 SEP
          12583 SEPS
         285122 SEP
                  (SEP OR SEPS)
         446082 SEPD
              1 SEPDS
         446083 SEPD
                  (SEPD OR SEPDS)
          91823 SEPG
              1 SEPGS
          91824 SEPG
                  (SEPG OR SEPGS)
         555054 SEPN
          35972 SEPNS
         573253 SEPN
                  (SEPN OR SEPNS)
        1364373 SEPARAT?
                  (SEPARAT? OR SEP OR SEPD OR SEPG OR SEPN)
        1152276 CARBON
          25288 CARBONS
        1161370 CARBON
                  (CARBON OR CARBONS)
         444036 DIOXIDE
           6518 DIOXIDES
         445689 DIOXIDE
                  (DIOXIDE OR DIOXIDES)
         209897 CARBON DIOXIDE
                  (CARBON(W)DIOXIDE)
           3504 SEPARAT? (5A) CARBON DIOXIDE
L3            6 L1 AND SEPARAT? (5A) CARBON DIOXIDE

=> s l2 and l3
L4            1 L2 AND L3

=> s l2 or l3
L5           12 L2 OR L3

=> s l5 and fischer tropsch
          23089 FISCHER
             15 FISCHERS
          23101 FISCHER
                  (FISCHER OR FISCHERS)
           7737 TROPSCH
           7637 FISCHER TROPSCH
                  (FISCHER(W)TROPSCH)
L6            0 L5 AND FISCHER TROPSCH

=> s l5 and adjust?
         251275 ADJUST?
L7            0 L5 AND ADJUST?
```

=> D L5 IBIB AB 1-12

L5 ANSWER 1 OF 12 CAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2004:691478 CAPLUS
DOCUMENT NUMBER: 141:192262
TITLE: Methanol plant retrofit for the manufacture of acetic acid
INVENTOR(S): Vidalin, Kenneth Ebenes; Thiebaut, Daniel Marcel
PATENT ASSIGNEE(S): Acetex Cyprus Limited, Cyprus
SOURCE: U.S., 16 pp., Cont.-in-part of U.S. 6,232,352.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 3
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6781014	B1	20040824	US 2002-129038	20020430
US 6274096	B1	20010814	US 1999-430888	19991101
US 6232352	B1	20010515	US 2000-547831	20000412
WO 2001032594	A1	20010510	WO 2000-CY4	20001031

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.:

US 1999-430808	A2	19991101
US 1999-430888	A2	19991101
US 2000-547831	A2	20000412
WO 2000-CY4	W	20001031

AB The retrofitting of an existing methanol or methanol/ammonia plant to make acetic acid is described. The existing plant has a reformer into which **natural gas** or another hydrocarbon and steam (water) are fed. Synthesis gas is formed in the reformer. All or part of the synthesis gas is processed to **sep.** out **carbon dioxide**, **carbon monoxide** and **hydrogen** , and the **sepd. carbon dioxide** is the exiting to the existing methanol synthesis loop for methanol synthesis, or back into the feed to the reformer to enhance **carbon monoxide** formation in the synthesis gas. Any remaining synthesis gas not fed into the **carbon dioxide separator** can be converted to methanol in the existing methanol synthesis loop along with **carbon dioxide** from the **separator** and/or imported **carbon dioxide**, and **hydrogen** from the **separator**. The separated **carbon monoxide** is then reacted with methanol to produce acetic acid or an acetic acid precursor by a conventional process.

REFERENCE COUNT: 40 THERE ARE 40 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 2 OF 12 CAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2002:555943 CAPLUS
DOCUMENT NUMBER: 137:127091
TITLE: Bimodal hydrogen manufacture
INVENTOR(S): Vidalin, Kenneth Ebenes
PATENT ASSIGNEE(S): Can.
SOURCE: U.S. Pat. Appl. Publ., 15 pp.
CODEN: USXXCO

DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2002098132	A1	20020725	US 2001-768030	20010122
US 6599491	B2	20030729		

PRIORITY APPLN. INFO.: US 2001-768030 20010122

AB The converting of an existing methanol plant to make **hydrogen** and optionally methanol is disclosed. The converted plant utilizes the steam reformer to which (a) a hydrocarbon, e.g., **natural gas**, or a lower alkanol, e.g., methanol, and (b) steam (water) are fed. Syngas is formed in the reformer. All or part of the syngas is processed in a CO converter and/or a **sepn**. unit to **sep**. out **carbon dioxide**, **carbon monoxide** and **hydrogen**. In the first mode, the CO converter is isolated and the **sepd**. **carbon dioxide** is fed either to the existing methanol synthesis loop for methanol synthesis, or back into the feed to the reformer to enhance **carbon monoxide** formation in the syngas. In the second mode, a lower alkanol is fed to the reformer , and the methanol synthesis loop is shutdown and isolated from the rest of the plant. Any remaining syngas not fed to the **carbon dioxide separator** can be converted to methanol in the existing methanol synthesis loop along with **carbon dioxide** from the **separator** and/or imported **carbon dioxide**, and **hydrogen** from the **separator**. In the second mode, the separated **carbon monoxide** is preferably recycled to the reformer and/or to the CO converter to enhance **hydrogen** production

L5 ANSWER 3 OF 12 CAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2002:505214 CAPLUS
DOCUMENT NUMBER: 137:64902
TITLE: Bimodal acetic acid manufacture in methanol plants
INVENTOR(S): Vidalin, Kenneth Ebenes
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., 22 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2002085963	A1	20020704	US 2000-751240	20001229
US 6531630	B2	20030311		

PRIORITY APPLN. INFO.: US 2000-751240 20001229

AB The converting of an existing methanol plant to make acetic acid is disclosed. The converted plant utilizes a steam reformer to which (a) a hydrocarbon, e.g., **natural gas**, or a lower alkanol, e.g., methanol, and (b) steam (water) are fed. Syngas is formed in the reformer. All or part of the syngas is processed to **sep**. out **carbon dioxide**, **carbon monoxide** and **hydrogen**, and the **sepd**. **carbon dioxide** is fed either to the existing methanol synthesis loop for methanol synthesis, or back into the feed to the reformer to enhance **carbon monoxide** formation in the syngas. When a lower alkanol is fed to the reformer, the methanol synthesis loop is shutdown and isolated from the rest of the plant. Any remaining syngas not fed to the **carbon dioxide separator** can be converted to methanol in the existing methanol synthesis loop along with **carbon**

dioxide from the **separator** and/or imported **carbon dioxide**, and **hydrogen** from the **separator**. The separated **carbon monoxide** is then reacted with the methanol to produce acetic acid or an acetic acid precursor by a conventional process. When the methanol synthesis loop is shutdown, an imported source of methanol is used.

L5 ANSWER 4 OF 12 CAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2002:363425 CAPLUS
DOCUMENT NUMBER: 136:373828
TITLE: Carbon dioxide capture process with regenerable sorbents
INVENTOR(S): Pennline, Henry W.; Hoffman, James S.
PATENT ASSIGNEE(S): United States Dept. of Energy, USA
SOURCE: U.S., 5 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6387337	B1	20020514	US 2000-616871	20000714
PRIORITY APPLN. INFO.:			US 2000-616871	20000714

AB A process to **remove carbon dioxide** from a gas stream using a cross-flow, or a moving-bed reactor. In the reactor the gas contacts an active material that is an alkali-metal compound, such as an alkali-metal carbonate, alkali-metal oxide, or alkali-metal hydroxide; or in the alternative, an alkaline-earth metal compound, such as an alkaline-earth metal carbonate, alkaline-earth metal oxide, or alkaline-earth metal hydroxide. The active material can be used by itself or supported on a substrate of carbon, alumina, silica, titania or aluminosilicate. When the active material is an alkali-metal compound, the **carbon-dioxide** reacts with the metal compound to generate bicarbonate. When the active material is an alkaline-earth metal, the **carbon dioxide** reacts with the metal compound to generate carbonate. Spent sorbent containing the bicarbonate or carbonate is moved to a second reactor where it is heated or treated with a reducing agent such as, **natural gas**, methane, **carbon monoxide** **hydrogen**, or a synthesis gas comprising of a combination of **carbon monoxide** and **hydrogen**. The heat or reducing agent releases **carbon dioxide** gas and regenerates the active material for use as the sorbent material in the first reactor. New sorbent may be added to the regenerated sorbent prior to subsequent passes in the **carbon dioxide** **removal** reactor.
REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 5 OF 12 CAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2002:138940 CAPLUS
DOCUMENT NUMBER: 136:202908
TITLE: Method of manufacturing synthesis gas
INVENTOR(S): Iijima, Masaki; Kobayashi, Kazuto; Morita, Kazuhiro
PATENT ASSIGNEE(S): Mitsubishi Heavy Industries, Ltd., Japan
SOURCE: Eur. Pat. Appl., 10 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1180544	A2	20020220	EP 2001-105475	20010314
EP 1180544	A3	20030226		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2002060203	A2	20020226	JP 2000-246913	20000816
US 2002024038	A1	20020228	US 2001-801720	20010309
US 6726852	B2	20040427		
ZA 2001002066	A	20010913	ZA 2001-2066	20010313
AU 744233	B1	20020221	AU 2001-28018	20010316
NO 2001001753	A	20020218	NO 2001-1753	20010406
RU 2258029	C2	20050810	RU 2001-110186	20010413

PRIORITY APPLN. INFO.: JP 2000-246913 A 20000816

AB A method of manufacturing a synthesis gas containing **hydrogen** and **carbon monoxide** comprises the steps of removing only **hydrogen** sulfide from a **natural gas** containing **hydrogen** sulfide and **carbon dioxide** by permitting the **natural gas** to pass through a **hydrogen** sulfide-removing device filled with a **hydrogen** sulfide absorbent, adding **carbon dioxide** and steam to the **natural gas** which the **hydrogen** sulfide has been removed to prepare a mixed gas, and feeding the mixed gas into a reaction tube of a reformer, thereby permitting mainly a steam reforming reaction to take place in the mixed gas. This method enables **hydrogen** sulfide in **natural gas** to be **removed** while permitting the **carbon dioxide** of **natural gas** to be effectively used, thereby reducing the quantity of **carbon dioxide** to be added to the **natural gas** to be transferred to the reformer.

L5 ANSWER 6 OF 12 CAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2001:352292 CAPLUS
DOCUMENT NUMBER: 134:328212
TITLE: Methanol plant retrofit for acetic acid manufacture
INVENTOR(S): Vidalin, Kenneth Ebenes
PATENT ASSIGNEE(S): Acetex Limited, Cyprus
SOURCE: U.S., 17 pp., Cont.-in-part of U.S. Ser. No. 430,888.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 3
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6232352	B1	20010515	US 2000-547831	20000412
US 6274096	B1	20010814	US 1999-430888	19991101
CA 2388961	AA	20010510	CA 2000-2388961	20001031
WO 2001032594	A1	20010510	WO 2000-CY4	20001031
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
EP 1226103	A1	20020731	EP 2000-972559	20001031
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL				
NZ 519314	A	20031031	NZ 2000-519314	20001031
RU 2250894	C2	20050427	RU 2002-114828	20001031

AU 781369	B2	20050519	AU 2001-11278	20001031
US 6353133	B1	20020305	US 2001-851915	20010509
NO 2002002063	A	20020626	NO 2002-2063	20020430
US 6781014	B1	20040824	US 2002-129038	20020430
PRIORITY APPLN. INFO.:			US 1999-430888	A2 19991101
			US 1999-430808	A2 19991101
			US 2000-547831	A 20000412
			WO 2000-CY4	W 20001031

AB The retrofitting of an existing methanol or methanol/ammonia plant to make acetic acid is disclosed. The existing plant has a reformer to which **natural gas** or another hydrocarbon and steam (water) are fed for the generation of synthesis gas (i.e., CO, H2, CO2) via steam reforming. All or part of the produced synthesis gas is processed to **sep.** out **carbon dioxide**, **carbon monoxide**, and **hydrogen**, and the **sepd.** **carbon dioxide** is fed either to the existing methanol synthesis loop for methanol synthesis, or back into the feed to the reformer to enhance **carbon monoxide** formation in the synthesis gas. Any remaining synthesis gas not fed to the **carbon dioxide separator** can be converted to methanol by hydrogenation in the existing methanol synthesis loop along with **carbon dioxide** from the **separator** and/or imported **carbon dioxide**, and **hydrogen** from the **separator**. The separated **carbon monoxide** is then reacted with the methanol to produce acetic acid or an acetic acid precursor by a conventional process.

REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 7 OF 12 CAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2001:338470 CAPLUS
DOCUMENT NUMBER: 134:328210
TITLE: Methanol plant retrofit for the manufacture of acetic acid
INVENTOR(S): Thiebaut, Daniel Marcel; Vidalin, Kenneth Ebennes
PATENT ASSIGNEE(S): Acetex (Cyprus) Limited, Cyprus
SOURCE: PCT Int. Appl., 44 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 3
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001032594	A1	20010510	WO 2000-CY4	20001031
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
US 6274096	B1	20010814	US 1999-430888	19991101
US 6232352	B1	20010515	US 2000-547831	20000412
CA 2388961	AA	20010510	CA 2000-2388961	20001031
EP 1226103	A1	20020731	EP 2000-972559	20001031
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL				
NZ 519314	A	20031031	NZ 2000-519314	20001031
RU 2250894	C2	20050427	RU 2002-114828	20001031
AU 781369	B2	20050519	AU 2001-11278	20001031

NO 2002002063	A	20020626	NO 2002-2063		20020430
US 6781014	B1	20040824	US 2002-129038		20020430
PRIORITY APPLN. INFO.:			US 1999-430888	A	19991101
			US 2000-547831	A	20000412
			US 1999-430808	A2	19991101
			WO 2000-CY4	W	20001031

AB The retrofitting of an existing methanol or methanol/ammonia plant to make acetic acid is disclosed. The existing plant has a reformer to which **natural gas** or another hydrocarbon and steam (water) are fed and synthesis gas produced. All or part of the synthesis gas is processed to **sep.** out **carbon dioxide**, **carbon monoxide**, and **hydrogen**, and the **sepd. carbon dioxide** is fed either to the existing methanol synthesis loop for methanol synthesis, or back into the feed to the reformer to enhance the amount of **carbon monoxide** formation in the synthesis gas. Any remaining synthesis gas not fed to the **carbon dioxide separator** can be converted to methanol in the existing methanol synthesis loop along with **carbon dioxide** from the **separator** and/or imported **carbon dioxide**, and **hydrogen** from the **separator**. The separated **carbon monoxide** is then reacted with the methanol to produce acetic acid or an acetic acid precursor by a conventional process. Also disclosed is the reaction of separated **hydrogen** with nitrogen, in a conventional manner, to produce ammonia and the reaction of a portion of the acetic acid in a conventional manner with oxygen and ethylene to form vinyl acetate. The nitrogen for the added ammonia capacity in a retrofit of an original methanol plant comprising an ammonia synthesis loop and the oxygen for the vinyl acetate process are obtained from a new air separation unit; process flow diagrams are presented.

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 8 OF 12 CAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER:	1999:595550 CAPLUS
DOCUMENT NUMBER:	131:247527
TITLE:	Meeting CO2 demands
AUTHOR(S):	Alderton, P. D.
CORPORATE SOURCE:	Foster Wheeler Petroleum Development Ltd, UK
SOURCE:	Hydrocarbon Engineering (1999), 4(7), 50-52 CODEN: HYENF5
PUBLISHER:	Palladian Publications Ltd
DOCUMENT TYPE:	Journal
LANGUAGE:	English

AB Use of pre-combustion carbon removal from **natural gas** used by power generation plants is described as a method for meeting demands for reduced CO2 levels. A viable process was developed first for a new land-based power station, and then for a typical offshore oil production platform. The **natural gas** is not used directly as fuel in the gas turbine, but is fed initially to a catalytic partial oxidation reactor where the carbon in the **natural gas** is converted to **carbon dioxide** using air as the oxidant. The **carbon monoxide** is, in turn, converted to **carbon dioxide** which is then **removed** and the resulting **hydrogen**-rich gas is used as fuel in the gas turbine. A CO2 capture of 90% or greater can be be achieved. The extracted CO2 can be injected into an oil reservoir to enhance oil recovery or used as a product in its own right.

REFERENCE COUNT: 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 9 OF 12 CAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER:	1997:776847 CAPLUS
DOCUMENT NUMBER:	127:360662

TITLE: Method and apparatus for manufacture of high-purity **hydrogen** by steam conversion of **natural gas**, conversion of **carbon monoxide** to **carbon dioxide**, **removal** of **carbon dioxide**, and diffusion of **hydrogen** through palladium membrane
INVENTOR(S): Budanichev, Sergej A.; Guk, Yurij N.; Kadnikov, Valerij P.; Kirnos, Igor V.; Klyshnikov, Sergej T.; Kukuj, Boris G.
PATENT ASSIGNEE(S): Sovmestnoe Predpriyatie Uralskij Nauchno-Inzhenernyj Tsentr "vodorod", Russia
SOURCE: Russ. From: Izobreteniya 1997, (21), 262. CODEN: RUXXE7
DOCUMENT TYPE: Patent
LANGUAGE: Russian
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
RU 2085476	C1	19970727	RU 1993-21176	19930422

PRIORITY APPLN. INFO.: RU 1993-21176 19930422
AB Title only translated.

L5 ANSWER 10 OF 12 CAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1997:397685 CAPLUS
DOCUMENT NUMBER: 127:17415
TITLE: Process for producing syngas and hydrogen from natural gas using a membrane reactor
INVENTOR(S): Galuszka, Jan Z.; Fouda, Safaa; Pandey, Raj N.; Ahmed, Shamsuddin
PATENT ASSIGNEE(S): Natural Resources Canada, Can.
SOURCE: U.S., 7 pp. CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5637259	A	19970610	US 1995-567102	19951204
CA 2190893	AA	19970605	CA 1996-2190893	19961121
CA 2190893	C	20000111		

PRIORITY APPLN. INFO.: US 1995-567102 A 19951204
AB A procedure for the production of synthesis gas and **hydrogen** from **natural gas** is described. The procedure includes: (a) providing a double tubular **hydrogen**-transfer reactor having an inner tubular wall defining a heated reaction zone containing a catalyst and an outer tubular wall defining an annular zone between the tubular walls, the inner tubular wall including a **hydrogen** semipermeable membrane portion adapted to permit diffusion of **hydrogen** through from the reaction zone to the annular zone while being impervious to other gases, (b) passing through the catalytic reaction zone a feedstock comprising a mixture of methane and oxygen or a mixture of methane and **carbon dioxide** or a mixture of methane, **carbon dioxide** and oxygen, (c) continuously **removing** from the reaction zone at least part of the **hydrogen** being formed by diffusion through thes **hydrogen** semipermeable membrane into the annular zone, (d) continuously removing diffused **hydrogen** from the annular zone, and (e) continuously removing a product mixture of **carbon monoxide** and **hydrogen** from the reaction zone. An apparatus diagram is presented.

L5 ANSWER 11 OF 12 CAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1989:556920 CAPLUS
DOCUMENT NUMBER: 111:156920
TITLE: Production and recovery of hydrogen and carbon monoxide
INVENTOR(S): Nicholas, David M.; Goff, Stephen P.; Roden, Thomas M.; Bushinsky, Joseph P.
PATENT ASSIGNEE(S): Air Products and Chemicals, Inc., USA
SOURCE: U.S., 13 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 4836833	A	19890606	US 1988-157434	19880217
PRIORITY APPLN. INFO.:			US 1988-157434	19880217

OTHER SOURCE(S): CASREACT 111:156920

AB A method for separating and recovering of high-purity H2 and CO from a gas mixture containing H2, CO, CO2, and CH4 (e.g. synthesis gas obtained in steam reforming of hydrocarbons) comprises passing the gas mixture at superatm. pressure through a solid adsorbent bed to remove CO2 by pressure-swing adsorption (PSA), purifying the CO2-free primary effluent by selective adsorption of CO in a 2nd adsorbent bed by PSA, and passing the gas stream through a series of selective semi-permeable membranes to recover a permeated stream of high-purity H2 (≥99 mol.%) and a non-permeated stream comprising ≥85 mol.% CO. The method gives high product yields, and has significantly reduced capital and operation costs.

L5 ANSWER 12 OF 12 CAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1974:523933 CAPLUS
DOCUMENT NUMBER: 81:123933
TITLE: Low-temperature processes for purifying hydrogen and carbon monoxide feedstocks for industrial chemical products
AUTHOR(S): Tanz, Heiner
CORPORATE SOURCE: Messer Griesheim G.m.B.H., Frankfurt, Fed. Rep. Ger.
SOURCE: Progr. Refrig. Sci. Technol., Proc. Int. Congr. Refrig., 13th (1973), Meeting Date 1971, Volume 1, 619-25. Editor(s): Pentzer, W. T. Avi: Westport, Conn.
CODEN: 28FQAP
DOCUMENT TYPE: Conference
LANGUAGE: English

AB Compared to naphtha, natural gas is less desirable for the production of CO-enriched gases because of its low C/H ratio. By new processes such as CO production by reforming and low-temperature separation, natural gas can be made into a desirable feedstock for the production of CO-enriched gases. Low-temperature gas-separation plants for the purification of H and CO and the removal of CO2 and N from natural gas are described.

WEST Search History

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DATE: Sunday, October 30, 2005

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		DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI; THES=ASSIGNEE; PLUR=YES; OP=ADJ	
☐	L7	L5 and hydrogen with fuel	17
☐	L6	L5 and hydrogen with fuel with reform$3	4
☐	L5	L4 and fischer tropsch	29
☐	L4	L2 and (remov$3 or separat$3)with carbon dioxide	52
☐	L3	L2 and (remov$3 or separat$3)nea5 carbon dioxide	0
☐	L2	L1 and adjust$3 near4 (syngas or synthesis gas or hydrogen near3 carbon monoxide)	71
☐	L1	natural gas same hydrogen with carbon monoxide with carbon dioxide and (steam near3 reform$3 or autothermal reform$3)	754

END OF SEARCH HISTORY